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RELIANCE ATTITUDES OF FARMERS IN CHOOSING HYBRID AND NON-HYBRID SEEDS IN CORN FARMING (CASE STUDY IN THE DISTRICT OF PURI DISTRICT. MOJOKERTO, EAST JAVA)

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ABSTRACT

The purpose of this study are: 1). Analyzed the attitude of the farmers trust in choosing Hybrid and Non-Hybrid seeds on corn farming. 2). Knowing the superior attributes of corn seed hybrid and non-hybrid is an option for farmers. 3). Analyzed the economic feasibility of farming of corn hybrid and non hybrid. The research method used analysis of Fishbein Multiattribute attitude models to detect first and secondary objectiveness, while the third objective economic analysis of farming used by an analysis of cost and revenue balance (Return and Cost Ratio). The finding are show 1). Farmers who consider the most important attributes in selecting seed corn hybrid (P-21), (Bisi-2) is the Production, Growing Power, Brand, Efficiency uses Fertilizer, Seed Availability and Seed Price. In the other side Resistant toward drought attributes deemed most farmers less important than other attributes. The most important attributes of corn seed non-hybrid (Local) is Seed Price, Growing Power, Production, Brand, Resistant toward drought and Efficiency uses Fertilizer. While Seed Availability attributes deemed most farmers less important than other attributes. 2). Superior attributes selected by farmers on farms using corn seed hybrid (P-21), (Bisi-2) are production, While that use corn seed non hybrid (local) are seed price.. 3). Corn farming that use seed hybrid (P-21) and (Bisi-2), more efficient from seed non hybrid (local), and economical beneficial with feasible to carried on.

Key word : corns farmer, feasibility and attitude

INTRODUCTION

Corn in Indonesian country is one of the strategic food commodities after rice and soybean. The field as big as ± 3,5 million hectare and national production in the year 2007 achieve around 13 million ton unfortunately not yet can fulfiil domestic corn need, that really ironic Indonesia stills to import corn from abroad as big as by an average around 1 million tons during 5 the last year. Several factor as problems in increasing production of corn such as soil fertility, the lack of capital ability farmer, lack of new technology including seed certified used, transportation infrastructure, distribution where not condusive for farmer, poor post-harvest handling and price uncertainty, especially at the time harvest.

According Suryana et al. (2005), domestic maize requirements in 2005 is estimated at 11.80 million tons, in 2010 increased to 13.60 million tons and in 2015 and 2020 respectively, 15.90 and 18.90 million tons. Indonesian corn productivity is still low, at 3:34 tons per hectare, despite an increase of 3:34 per cent per year. Average maize production during the period 1990 to 2004 amounted to 8.72 million tonnes and an increase of 3.71 percent per year. Meanwhile, corn needs to reach 11.62 million tons in 2004, whereas if the use of hybrid seeds and intensive maintenance, the productivity of corn could reach 8 tonnes per ha (Suryana et al. 2005). These conditions illustrate the lack of the use and maintenance of quality corn seed that has not been intensive in the production of corn in Indonesia. Efforts to minimize the gap between production and demand for corn in the country can actually be done in two ways to increase corn production through area expansion and increased productivity through the use of improved seed.

Corn are food commodities has important roles and strategic in agriculture development either at East Java neither Mojokerto Regency. The fields corn area plants at Mojokerto Regency ± 26.050 Ha, with details land where used plant corn hybrid for the width of ± 21.365 Ha, while the rest ± 4.685 ha planted corn non hybrid. Sentra of corn plants at Mojokerto Regency in 3 (three) districts, that is: Dlanggu, Puri, and Gondang District. Especially Puri District, broadly corn area plants ± 2000 Ha that using hybrid seed ± 1.850 ha, and the rest using seed non hybrid (Anonymus, 2009). In order to corn need fulfillment for consumption, animal feed, milled to be flour, food products and drink, and also to support the increasing income and welfare of farmers, so farmer has realized the important certifiable seed use. The corn seed hybrid brand quantity on the market by seed producers to farmer in areas of research such as: Pioneer (P-21, P-16, P-12, P-11), that produce PT. Dupont, Bisi-2 from PT. BISI International tbk. The affiliated firm from PT. Charoen Pokphan, C-7 from PT PERTANI or from the government, NK-33 from PT. Novartis Thailand, DK-979 from Monsanto.The problem that faced farmer at Puri District, that is ability to buy seed corn hybrid the price still relative expensive, so that corn seed used seed corn non hybrid (local), as an alternative choice.

Based on background, this research are Attitude Belief Farmers in Selecting Seed Corn Hybrids (P-21), (Bisi-2) and Non-Hybrid (Local) on Corn Farming is important to done. Attitude as one of internal environment factor that can influence somebody in take decision buy product. Consumer attitude is response or

evaluation that given consumer consistently, consistent, beneficial or doesn't beneficial, positive or negative, like or dislike, agree or disagree towards an object (Azwar, 2000). According to Kotler (1997), consumer behaviour is influenced four primary factor, that is 1). Culture factor consists of culture, class social, subculture; 2). Social factor consists of reference group, family, character and status; 3). Personality factor consists of age and life cycle, job, economy conditon, life style, personality and self concept; 4). Spritual factor consists of motivation, achievement, knowledge, beliefs and attitude. The purposes of this research are :

1. Analyze the attitude of trust of farmers in selecting to corn seeds hybrids and non-hybrid farming.
2. Knowing the superior attributes of corn seed hybrid and non-hybrid is the choice of farmers.
3. Analyze the economic feasibility of farm-level corn hybrids and non-hybrid.

MATERIALS AND METHOD

This research location is determined on purposively at Puri District, Mojokerto Regency with consideration that Puri District is s the center of corn production at Mojokerto Regency. The research was done in July up to September 2009.

The population in this research are corn farmer who uses corn seed hybrid and non hybrid at Puri District, Mojokerto Regency. The sample selection was done according to purposively, towards farmer who use Pioneer brand hybrid corn seed (P-21), (bisi-2) and non hybrid seed (local seed) at Puri District with cost reason, energy and time available, so sample total that taken as much as 90 respondents with farmer details that use hybrid seed (P-21) as much as 57 respondents, farmer who use seed hybrid (Bisi-2) as much as 23 respondents and farmer whom use seed non hybrid (local) as much as 10 respondents.

Analysis of Data

While to analyze first and second aimed by using tabulation and Weighting Likerts Scale approach (Hague and Harris, 1995), towards product attributes, from result data questionnaire that describe where does consumer present (research area), then continued with measures attitude and consumer behaviour is done by using a model multiatribut.

In this Likerts Scale used five scale levels that represent each answers to question that submitted in respondent, such as the following example:

Your opinion is about corn seed brand that is used :

Famoustly	Famous	Enough Famous	Less known	Unknown
(+2)	(+1)	(0)	(-1)	(-2)

The notation of 2, 1, 0, -1, and -2, are number that adjusted with importance level that need in each answer.

As to measures attitude and consumer behaviour can be done with multiatribut model. One of the most famous model of attitude is the attitude model of Fishbein multiatribut. Fishbein attitude model focuses on the prediction that formed one's attitude toward a particular object. In a symbolic formula can be expressed as follows:

$$Ao = \sum_{i=1}^{n} bi\, ei$$

Where:

Ao : Attitude towards object
bi : The strength of belief that objects have attributes I
ei : Evaluation of the attributes I
n : Amount of superiorities attribute

Attributes of corn seed in these research :

1. Brand
2. Growing power
3. Resistant towards drought
4. Efficiency uses fertilizer
5. Seed price
6. Availability at market
7. Result or production

From analysis result supposed can give description about farmer behaviour attitude in choose corn seed that be used as seed in farming, also could be made as one of the considers factor to decide in buy product or certain seed brand. Farmers attitude towards product attribute could be different, because belief or trust and evaluation towards attribute that has product, and in the end will show willing or

farmer interest to buy towards a corn seed product brand based on superior attribute.

Variable Attribute

The variable in this research is divided in 2 (two) variable groups that is: Trust Variable *(bi)* and Evaluation Variable *(ei)*. First group belief variable (bi) towards seventh product attribute, then every respondent is asked to declare attitude towards is corn seed hybrid brand (P-21), (Bisi-2) and non hybrid (local), has seven attributes that is: 1. Product brand 2. Growing power 3. Resistant towards drought 4. Efficiency uses fertilizer 5. Seed price 6. Availability at market and 7. Result or production, inside 5 scale numbers, begin + 2 mean very good until - 2 that mean very bad. The average score of each variable will be used to calculate the score Multiatribut Fihsbein Attitude Models.

Elements of Trust *(bi)* towards product attribute that use corn seed hybrid (P-21), (Bisi-2) and non hybrid (local or non label) can be presented in table 1. The variable for second group is evaluation variable towards seven product attributes (variable *ei*), consist of seven questions, that is: 1. Product brand 2. Growing power 3. Resistant towards drought 4. Efficiency uses fertilizer 5. Seed price 6. Availability at market and 7. Result or production. Every respondent was asked to declare the attitude or evaluate towards product attribute in 5 scale number, begin + 2 that mean of very importance until - 2 that mean very not important. The question is to measure the components of ei are as follows:

Tabel 1. Trust Score Attribute - Attribute Corn Seeds Hybrid (P-21), (Bisi-2) and Non-Hybrid (Local).

Brand Wonderful	+2	+1	0	–1	–2	Very Bad
Growing power Very Good	+2	+1	0	–1	–2	Very Bad
Resistant towards drought Very Resist	+2	+1	0	–1	–2	Not Resist
Efficiency uses fertilizer Very Efficient	+2	+1	0	–1	–2	Not Efficient
Seed price Very Expensive	+2	+1	0	–1	–2	Very Cheap
Availability at market Very available	+2	+1	0	–1	–2	Not available
Result or production Very High	+2	+1	0	–1	–2	Very Small

Evaluation element *(ei)* towards product attribute that use corn seed hybrid (P-21), (Bisi-2) and non hybrid (local or non label) can be presented in table 2.

Hybrid corn seed product and non hybrid that go around at research area, which became the object of this study with the attributes: brand, growing power, resistant towards drought, efficiency uses fertilizer, seed price, availability at market and result or production, then given score 2, 1, 0, -1, -2. For the category of Very Important, Important, Neutral, Not Important, Very Important. After obtaining a confidence score, the farmer / consumer was asked back to show the evaluation of each attribute are also given a score of +2, +1, 0, -1, -2 for the category of Very Good, Good, Neutral, No Good, Very Bad .

Consumers attitude overall, in this case farmer towards corn seed product, knowable with add up each score is multiplied confidence score evaluation. Sum is a score that made reference to determine the attitude of trust farmers / consumers in choosing the seed corn that became the object of research.

Table 2. Score Evaluation of Attributes - The attributes of Corn Seeds Hybrid (P-21), (Bisi-2) and Non-Hybrid (Local).

Brand Very Important	+2	+1	0	–1	–2	Very not Important
Growing power Very Important	+2	+1	0	–1	–2	Very not Important
Resistant towards drought Very Important	+2	+1	0	–1	–2	Very not Important
Efficiency uses fertilizer Very Important	+2	+1	0	–1	–2	Very not Important
Seed price Very Important	+2	+1	0	–1	–2	Very not Important
Availability at market Very Important	+2	+1	0	–1	–2	Very not Important
Result or production Very Important	+2	+1	0	–1	–2	Very not Important

2. Farming Feasibility Analysis

To analyze aim thirdly used formula RC-rasio *(Return Cost Ratio)*. Calculation of R/C ratio based in equation as follows:

$$\text{R / C ratio} = \frac{\text{Acceptance}}{\text{Total production costs}}$$

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Criteria for testing are:

R / C ratio <1 the farm is inefficient and losing money.

R / C ratio = 1, the farm did not get the benefit and not suffer losses *(balance)*.

R / C ratio > 1, the farm is efficient and profitable.

RESULTS AND DISCUSSION

1. Analysis of Multiatribut Fishbein Attitude.

a. Analysis of Key Attributes of a Choice Farmers in Selecting Corn Seed Hybrids (P-21), (Bisi-2) and Non-Hybrid (Local).

Table 3. show that evaluation analysis result (ei) importance towards corn seed attribute hybrid (P-21), (Bisi-2) and non hybrid (local), obvious show that production attribute gets highest score (1,322, then followed by power attribute grows (1,144). this matter related to farmer hope high production, furthermore if tall corn production so, supposed farmer gets tall income also. Similarly, assume that farmers grow high-power it will get higher yields. While five other attributes obtained scores below the value 1.00. This shows that the respondents (corn farmers) production and the ability to grow compared to brand attributes, efficiency of fertilizer, seed availability, price and drought resistant seeds. Evaluate the value of the lowest attribute is drought resistant (0.289), which means that farmers consider drought resistant attributes are most important than other attributes in selecting or using a seed corn. This is because the farmers in the area of research in the habit will always take turns to irrigate their land in farming groups in their respective regions, so that farmers consider the attributes of drought tolerance is the least important when compared with other attributes.

The analysis result in table 3. give description that consumer trust score (bi) towards corn seed hybrid attribute (P-21) and (Bisi-2) highest in “production” that is with score each (1,421) and (1,348). This happens becaused the farmers believe with use hybrid seed type (P-21) also (Bisi-2) later be got high production, although the production result dominanter in corn seed hybrid (P-21). While the growing power of attributes ranked second with a score of each (1.211) and (1.087), followed by the brand attributes, efficiency of fertilizer, seed availability, seed prices and drought tolerance. The lowest trust value is "resistant to drought" with each score (0.246) for seed corn hybrid (P-21) and (0.391) to (Bisi-2).

While the consumer trust score (bi) to attribute corn seed non-hybrid (Local), the highest is the "price of seed" with a score (1.900), this is related to the level of

farmers' ability to provide capital in farming, due to the difference in price between the maize seed hybrids with non-hybrid (local) is very significant, so that the farmers who use local corn seed revenues are worried they will receive reduced if the use of hybrid corn seeds that are expensive. All attributes of non-hybrid corn seeds (Local), except "Seed Price" turns out to obtain a lower confidence score than the attributes of hybrid corn seeds (P-21) and (Bisi-2), it shows that farmers are more confident that more hybrid seed corn quality than non-hybrid maize seed, although because of limited capital they have, then there are farmers in the area of research that uses non-hybrid corn seeds (local) as an alternative option. Score confidence in the attributes of non-hybrid corn seeds (Local) which is the lowest attribute fertilizer efficiency and availability of seeds, which have a minus score, respectively - each (- 0.100) and (- 0.900) it shows that farmers in the area of research that uses non-maize seed hybrid (Local), assume that attribute the efficiency of fertilizer and seed availability is considered the least important when compared with other attributes. The pattern of thought or that assumption is because the local corn farmer believes that the non-hybrid corn (Local) not wasteful in the use of fertilizers and even without any nurtured to survive and be able to produce enough for them. While related to seed availability was ranked the lowest score, because the farmers who use non-hybrid corn seeds (local) assumes no problem in terms of provision of local corn seed, it happens because the local corn seed produced by the farmers, so that ultimately there is no dependence on seed producers and distributors or traders of seeds.

Table 3. Evaluation Analysis Result and Farmer Trust towards Multiatribut Corn Seed Hybrid (P-21), (Bisi-2) and Non hybrid (local).

No	Attribut	Evaluation (*ei*)	Trust (*bi*)			Trust attitude towards attribute		
			P-21	Bisi-2	Local	P-21	Bisi-2	Local
1	Brand	0,933	1,018	0,957	0,400	0,949	0,893	0,373
2	Growing power	1,144	1,211	1,087	0,900	1,385	1,244	1,030
3	Resistant toward drought	0,289	0,246	0,391	0,300	0,071	0,113	0,087
4	Efficient Fertilizer	0,811	0,957	0,869	–0,100	0,776	0,705	–0,081
5	Seed Prices	0,556	0,333	0,522	1,900	0,185	0,290	1,056
6	Seed Availability	0,611	0,842	0,739	–0,900	0,515	0,452	–0,549
7	Production	1,322	1,421	1,348	0,700	1,879	1,782	0,925
						5,760	5,479	2,841

b. Main Multiatribut Attitude Analysis Of Value Evaluation (ei) and Consumer Trust (bi), which became Farmers Choice in Selecting Corn Seed Hybrids (P-21), (Bisi-2) and Non-Hybrid (Local).

The Analysis results of multiatribut attitude towards Value Evaluation (ei) and Consumer Trust (bi) on the use of corn seeds hybrid (P-21), (Bisi-2) and Non-Hybrid (Local) can be seen in Table 4. Table 4. shows that the results of the analysis "Trust Attitude" Consumers (ei.bi) which is a combination of interests and consumer confidence Evaluation of corn seed hybrid multiatribut (P-21), and (Bisi-2), indicating that the attribute "production" to obtain the highest score, both for corn seed hybrid (P-21) and (Bisi-2), with respective scores (1.879) and (1.782) with interpretation Very Like. Then followed the attribute " growing power" both on the corn seed hybrid (P-21) amounted to (1.385) and (Bisi-2) for (1.244) with interpretation Like. While the third is the attribute of the selected farmers "brand" both on the corn seed hybrid (P-21) = (0.949) and seeds (Bisi-2) = (0.893), respectively - each with interpretation and Very Like. Then, the attitude of trust in the research area farmers who use corn seed hybrid (P-21) and (Bisi-2) position the attribute "production" as an attribute of superior because farmers expect high production further if high production is expected to earn higher incomes . As for other attributes found by farmers in the study area is considered low, with scores below the 1.00. This shows that more farmers to consider the attribute "production" and attribute "growing power" in selecting corn seed hybrid (P-21), and (Bisi-2) compared to other attributes. The attitude of farmers towards trust attributes of corn seeds hybrid (P-21) and (Bisi-2), which was considered by the lowest score is the attribute of " resistant drought " with an individual score each (0.071) and (0.113). It shows that farmers give confidence to attribute attitudes to drought resistant seeds (P-21) and (Bisi-2) is not interested or less preferred.

Table 4. The results showed that farmers using the model of trust attitudes toward objects or Fisbein multiatribut corn seed hybrid products (P-21), (Bisi-2) and non-hybrid (Local), indicating that the corn seed hybrid (P-21) obtained the highest total score that is equal to 5.760 there is a difference or a difference of thin compared with corn seeds hybrid (Bisi-2), that is equal to 5.479. Meanwhile, when compared with non-hybrid corn seed (Local), then there is a significant difference, namely to obtain a total score of 2.841. This shows that the seeds of maize hybrids (P-21) and (Bisi-2), has the advantage that more than non-hybrid corn seeds (Local), which means that farmers in the area of research is more like using his seed

corn hybrids from the non-hybrid. It was proved that the farmers in determining his choice of attitudes or beliefs attributes of products offered, truly based on the evaluation and experience in the field. Rangkuti (2003), Attitude is a key component in purchasing behavior. The study of attitudes is the key to understanding the purchasing behavior. The attitude is the result of evaluation that reflects the taste likes and dislikes of the product, so that marketers can guess the potential purchase and develop more effective strategies.

According to Mowen and Minor (2002), that consumer confidence is about consumer knowledge of such objects, attributes, and benefits. Such knowledge is useful in communicating a product and its attributes to consumers. Decision making is a cognitive process that holds the memory, thinking, processing information and the evaluative judgments. Superior attributes of hybrid maize seed and non-hybrid is the choice of farmers, can be presented in Figure 1.

Table 4. Attitude Object Models and Their Interpretation Fishbein Farmers Against all Respondents Users Corn Seeds Hybrid (P-21), (Bisi-2) and Non-Hybrid (Local) at Puri District, Mojokerto Regency.

No	Attribut	*bi.ei* Corn seed hybrid (P-21)	Interpretation	*bi.ei* Corn seed hybrid (Bisi-2)	Interpretation	*bi.ei* Corn seed hybrid (Loca)	Interpretation
1	Growing power	0,949	Like	0,893	Quite Like	0,373	Less preferred
2	Resistant toward drought	1,385	Like	1,244	Like	1,030	Like
3	Efficient Fertilizer	0,071	Less preferred	0,113	Less preferred	0,087	Less Like
4	Seed Prices	0,776	Quite Like	0,705	Quite Like	- 0,081	Unpopular
5	Seed Availability	0,185	Less preferred	0,290	Less preferred	1,056	Like
6	Production	0,515	Quite Like	0,452	Quite Like	- 0,549	Unpopular
7	Growing power	1,879	Very Like	1,782	Very Like	0,925	Like
Attitudes towards the object *(Ao)*		5,760		5,479		2,841	

Source : Primary Data in Year 2009.

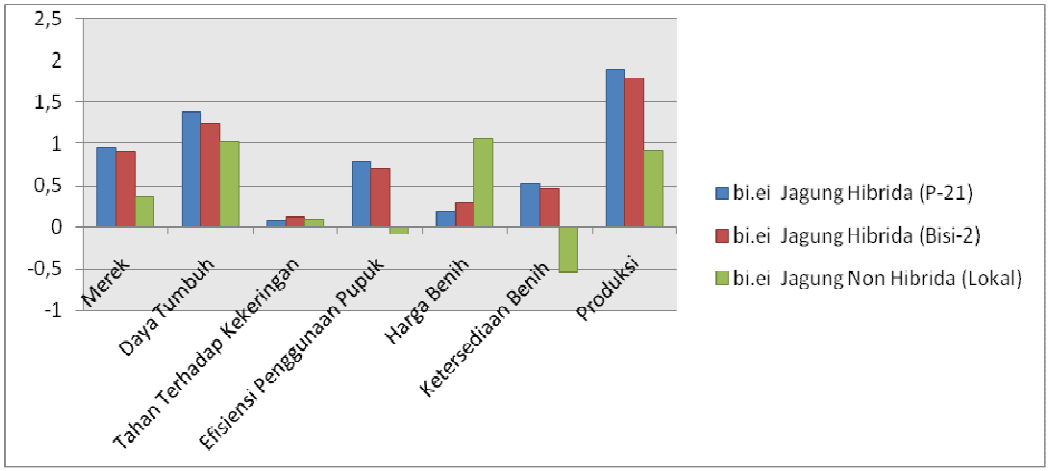

Figure 1. Superior attributes of hybrid maize seed and non-hybrid that choice of farmers

2. Analysis Results of Economic Analysis Using Farm Corn Hybrid Seeds (P-21), (Bisi-2) and non-Hybrid (local).

a. Balance Analysis and Cost

Reception *(Return and Cost Ratio)* that one way to determine whether a farm is efficient or not efficient, it can be done with Return and Cost Ratio Analysis, which is the ratio between revenue and total cost figures mentioned in the unit. RC-Ratio The amount of numbers on farms that use corn seed hybrid (P-21), (Bisi-2) and non-hybrid (Local), can be presented in Table 5.

The analysis result in table 5, got value RC-ratio in corn hybrid farming (P-21) as big as 2,53 bigger in comparison with corn hybrid farming (Bisi-2) as big as 2,45 and corn non hybrid farming (local or “putihan”) got result as big as 1,96.

Value of RC-ratio in corn hybrid farming (p-21) as big as 2,53 this means that every Rupiah that taked in corn farming by using seed hybrid (P-21), will produce dirty revenue as big as Rp. 253, -. and so do value RC-ratio in corn farming hybrid (bisi-2) as big as 2,45 this means that every Rupiah that taked in corn farming by using seed hybrid (Bisi-2), will produce dirty revenue as big as rp. 245, -. while result value rc-ratio in corn non hybrid farming (local or “putihan”) as big as 1,96 this means that every rupiah that taked in corn farming by using seed non hybrid (local or “putihan”), will produce dirty revenue as big as Rp. 196, -.

Analysis result RC-ratio in table 5, explainable that corn hybrid farming (P-21) also (Bisi-2) bigger in comparison with corn farming non hybrid (local or “putihan”), as third aim in this research, that is: that is corn hybrid farming and non hybrid economical beneficial and feasible to carried on with developed, obvious proved.

Economy analysis result indicates that show corn farming that use seed hybrid (P-21) also (Bisi-2), more efficient from in corn farming that use seed non hybrid (local or "putihan"), and beneficial (feasible economically) when apply variables exist in these research correctly. Based on Soemartono, (1980) opinion that good quality of seed comes from variety superior be one of the important factor that determines tall the low result per unit (production) a plants.

Economy analysis result gives description that farmer in research are within determine the choice attitude towards corn seed use hybrid (P-21), (Bisi-2) and non hybrid (local), not only profit reason whom they obtain, but also capitalization ability reason whom they mine, so that farmer that dominate or has capital enough, so inclined will choose or use corn seed hybrid, good hybrid (p-21), also (Bisi-2).

While the farmer that dominate or has capital a little or limited, therefore inclined will choose or use corn seed non hybrid (local). It means farmer in choose or use corn seed, good also non has fanaticism aloof, describe corn seed product on the market seed producers in research area has market segment self, although market segment or the consumer can shift to seed product other, caused information factor passes advertisement, agriculture extension agent or from farmer other, also based on individual experience and another person experience.

Table 5. Analysis Return and Cost Ratio of Corn Hybrid Farming System (P-21), (Bisi-2) and Non-Hybrid (Local or "putihan") in the Mlaten, Medals and Puri Village, Puri District Mojokerto Regency in 2009.

Description	Corn Hybrid (P-21) (USD)	Corn Hybrids (Bisi-2) (USD)	Corn (Local) (USD)
Acceptance	7.642.456,-	6.921.739,-	2.732.000,-
Total Cost	3.017.842,-	2.827.934,-	1.395.500,-
RC - Ratio	2,53	2,45	1,96

Source : Primary Data in Year 2009.

CONCLUSIONS

Several things that conclude from these research :

1. Farmer considers importantattributes in choose corn seed hybrid (P-21), (Bisi-2) production, growing power, brand, efficiency uses fertilizer, seed availability and seed price. While attribute resistant towards drought is looked at farmer at least important if compare with another attribute. The important attributes in choose corn seed non hybrid (local) are seed price, growing power,

production, brand, resistant towards drought and efficiency uses fertilizer. Beside, seed availability attribute is looked at farmer at least important if compare with another attribute.

2. Superiroty attribute that chosen by farmer in corn farming that use seed hybrid (P-21), (bisi-2) are production. While that use corn seed non hybrid (local) are seed price.
3. Corn farming that use seed hybrid (P-21) and (Bisi-2), more efficient from seed non hybrid (local), and economical beneficial with feasible to carried on.

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